

respectively). These EPMs include consultation with potentially affected Native Americans. On this project, and as further described in Section 4.3, Western consulted with the California NAHC and three Federally recognized tribes: the Shingle Springs Band of Miwok Indians, the Ione Band of the Miwok Indians, and the United Auburn Indian Community of the Auburn Rancheria. Contact was also made with groups who have petitioned for Federal recognition status. These include the Muwekma Indian Tribe, the Miwok Indian Community of the Wilton Rancheria and the Indian Canyon Mutsun Band of Costanoan. Consultation helps avoid and minimize adverse impacts to Native Americans by better defining their concerns, locations of TCPs, and cultural practices that could be affected by the Proposed Action and alternatives.

4.5.2.3 IMPACTS FROM PROPOSED ACTION—NEW TRANSMISSION O'BANION SUBSTATION TO ELVERTA SUBSTATION; REALIGNMENTS; RECONDUCTORING ELVERTA SUBSTATION TO TRACY SUBSTATION

Most of the Proposed Action would be constructed in existing ROW, and the portion that would require new ROW (Segments A₁ and G) would mostly be next to existing ROW. It would be carefully sited to avoid any displacement of nearby rural residences or businesses. Therefore, no minority or low-income populations would be displaced and the Proposed Action would not divide the communities they live in. Construction could cause minor adverse impacts, such as traffic diversions at detours, or adverse air quality and noise impacts near the routes construction trucks would travel, or where construction equipment is used. Minority or low-income landowners could experience negative impacts if their land is needed for part of the new ROW included in the Proposed Action; however, most affected land is undeveloped or agricultural. No businesses or residences would be displaced. The acquisition of land for new ROW is not expected to cause significant or disproportionate impacts to minority and low-income populations.

Other low-income or minority individuals could experience positive employment and income impacts if hired as part of a construction crew needed to work on the Proposed Action. The Proposed Action would improve the reliability of power supplies in the areas served by the related transmission lines, which could help avoid adverse employment and income impacts during power shortages.

Western's EPMs include siting facilities to avoid TCPs and other cultural sites important to Native Americans. These practices and compliance with the cultural resources PA during post-EIS phases of Proposed Action implementation would help avoid and minimize adverse impacts to Native Americans.

Cultural resources, EMFs, health and safety, and socioeconomic analyses (Sections 4.3, 4.4, 4.8 and 4.12, respectively) all defined potential impacts on minority and low-income populations. However, given Western's EPMs, and the nature and location of the Proposed Action, none of these impacts is expected to be significant. Minority and low-income populations are not expected to be disproportionately impacted.

4.5.2.4 IMPACTS FROM ALTERNATIVE 1—RECONDUCTORING O'BANION SUBSTATION TO TRACY SUBSTATION

The impacts of Alternative 1 on minority and low-income populations would be similar to those described for the Proposed Action. No new ROW would be required. Minority and low-income populations are not expected to be disproportionately impacted.

4.5.2.5 IMPACTS FROM ALTERNATIVE 2—NEW TRANSMISSION O'BANION SUBSTATION TO ELVERTA SUBSTATION AND REALIGNMENTS

The impacts of Alternative 2 on minority and low-income populations would be similar to those described for the Proposed Action. Minority and low-income populations are not expected to be disproportionately impacted.

4.5.2.6 IMPACTS FROM ALTERNATIVE 3—NEW TRANSMISSION ELK GROVE SUBSTATION TO TRACY SUBSTATION

The impacts of Alternative 3 on minority and low-income populations would be similar to those described for the Proposed Action. Minority and low-income populations are not expected to be disproportionately impacted.

4.5.2.7 IMPACTS FROM THE NO ACTION ALTERNATIVE

Under the No Action Alternative, power shortages may be more frequent than shortages under the Proposed Action and action alternatives. Power shortages can have a disproportionate impact on low-income and minority workers with hourly wages, as opposed to salaries, who work for manufacturing and other businesses especially affected by disruptions in power service.

4.6 FLOODPLAINS

4.6.1 AFFECTED ENVIRONMENT

This section describes existing floodplain conditions within the study area and how the Proposed Action and alternatives would affect floodplains. Floodplains perform the natural, vital function of conveying and dissipating the volume and energy of peak, surface runoff flows downstream. Periodic flood flows form and sustain specific habitat types (such as wetland and riparian areas) within the floodplains (see

Sections 4.2 and 4.16 for discussion of habitat types). Environmental regulations have been developed to preserve unimpaired flood flows through established floodplains, prevent flood-related damage to downstream resources, and protect unique habitat types and species.

Activities affecting floodplains, and Waters of the United States typically found in floodplains, are regulated under Section 404 of the *Clean Water Act* (CWA) (33 U.S.C. §1251, *et seq.*) and EO 11988, Floodplain Management (42 *Federal Register* [FR] 26951, May 24, 1977). DOE has established policy and procedures in 10 CFR Part 1022 to ensure that DOE activities in floodplains comply with the EO requirements. This section incorporates the required information to comply with 10 CFR Part 1022. The Final EIS would provide a statement of findings explaining why specific activities would be located in the floodplain, what alternatives were considered, and the steps to be taken to minimize unavoidable impacts to the floodplain.

4.6.1.1 RESOURCE STUDY AREA

The study area includes floodplain portions of the Sutter Bypass, the Feather, American, Cosumnes, Mokelumne, and San Joaquin rivers, and associated smaller tributary floodplains crossed by or along the existing, Proposed Action, and alternative transmission ROW alignments.

Floodplains within the study area were determined by reviewing the Federal Emergency Management Agency (FEMA) maps of delineated floodplains. Floodplains for the larger tributaries are constrained by levees to prevent exten-

sive overbank flooding and convey peak flows downstream. In some locations the levees have been set back, expanding the area available to flooding to reinstate a more natural local flood regime. The levee setback areas increase the likelihood of interaction with floodplain resources.

4.6.1.2 ISSUES OF ENVIRONMENTAL CONCERN

Issues of concern are the potential for the structure footings and access roads to alter or impair the ability of floodplains to convey flood flows. Facilities and construction activities could obstruct flows or decrease bank stability, increasing erosion. Reduced floodplain capacity may adversely impact lives and property downstream, as well as a wide variety of natural resources. There are two types of floodplains in the study area: 1) the 100-year floodplain has a 1-percent chance of flooding in any given year, and 2) the 500-year floodplain has a 0.2 percent chance of flooding in any given year. This likelihood of occurrence is based on historic hydrology; future flood flows may be more or less frequent.

4.6.1.3 CHARACTERIZATION

A large portion of the study area is located within the broad, combined floodplain of the major waterways listed above. Line Segments A through H, including A₁ and E₁, cross through the 100- and 500-year floodplains of the various surface watercourses between O'Banion Substation and Tracy Substation.

Figure 4-2 shows where segment alignments intersect various floodplains. Table 4.6-1 summarizes study area ROW/floodplain intersections by line segment.

Table 4.6-1. Summary of Floodplains by Line Segment

Line Segment	Total Segment Length (in miles)	Miles/Acres Within 100-yr Floodplain	Miles/Acres Within 500-yr Floodplain	Miles/Acres Outside 500-yr Floodplain
A / A ₁	22.4	17.0/258.0	3.4/53.0	2.0/3.0
B	4.2	0.3/4.5	-	3.9/59.1
C	11.2	3.7/56.0	-	7.5/113.6
D	15.2	6.0/91.0	-	9.2/139.4
E / E ₁	46.2	19.8/300.0	25.0/379.0	1.4/21.2
F	1.4	0.3/3.8	-	1.1/16.7
G	5.0	0.4/6.1	-	4.6/69.7
H	2.2	-	-	2.2/33.3
Proposed Action	107.8	47.5	28.4	31.9
Alternative 1	99.2	46.8	28.4	24.0
Alternative 2	35.2	18	3.4	13.8
Alternative 3	46.2	19.8	25.0	1.4

Source: Original September 2002

Figures 3-1 through 3-8 show additional detail of the segment and milepost locations.

Segments A and A₁ cross approximately 17 miles (258 acres) of the 100-year floodplain. These 17 miles include 9.3 miles along the east side of Sutter Bypass (MP 0.0 to 9.3), 1.3 miles crossing the Feather River floodplain (MP 10.5 to 11.8), and 6.4 miles in the lesser floodplains of Burkham Slough (MP 15.0 to 16.3), Cross Canal, the east side of Pleasant Grove Creek Canal, Pleasant Grove Creek, and Curry Creek at MP 17.3 to 22.4. The segment crosses the 500-year floodplain of Sutter Bypass and the Feather River for 3.4 miles (53 acres) at MP 9.3 to 10.5 and MP 11.8 to 14.0. Two miles of this alignment (MP 14.0 to 15.0 and MP 16.3 to 17.3) are outside the 500-year floodplain.

Segment B is outside the 500-year floodplain, except for three minor tributary crossings of 0.1 miles each within the 100-year floodplain at MP 0.7, 3.5, and 3.9, respectively (4.5 acres total).

Segment C is outside the 500-year floodplain from MP 0.0 to 7.5. The segment alignment falls within the 100-year floodplain for approximately 3.7 miles (56 acres) along the north bank of the American River from MP 7.5 to 11.2.

Segment D crosses about six miles (91 acres) of the 100-year floodplain, including 4.4 miles along the north bank of the American River. The ROW parallels, then crosses the American River floodplain from MP 0.0 to 4.4. The other 1.6 miles are minor tributary crossings at MP 5.6 to 6.6, 7.8, 13.8, and 15.7. The remaining portions of this segment from MP 4.4 to 15.2 fall outside the 500-year floodplain.

Segments E and E₁ cross about 19.8 miles (300 acres) of 100-year floodplain, mostly (12.2 miles) in the eastern floodplain of the Cosumnes River and northern and southern floodplains of the Mokelumne River at MP 1.0 to 6.8, MP 7.3 to 12.7, MP 12.8 to 13.0, and MP 13.3 to 14.0. The ROW crosses a small 100-year floodplain drainage at MP 17.4 to 17.8 and reenters the 100-year floodplain at Pixley Slough, MP 24.0 to 24.7, then crosses a minor drainage at MP 25.1 to 25.3. The ROW continues through the floodplains of Five Mile Slough and the San Joaquin River from MP 26.1 to 30.5, the Middle River (MP 37.0 to 38.0), the Old River (MP 43.3 to 43.8), and the Delta-Mendota Canal (MP 44.4 to 44.8). The segment crosses approximately 25 miles (379 acres) of the 500-year floodplain of the various watercourses at MP 12.8, MP 13.0 to 13.3, and MP 14.0 to 17.4, MP 17.8 to 24.0, MP 24.6 to 25.1, MP 25.3 to 26.1, MP 30.5 to 37.0, MP 38.0 to 43.3, MP 43.8 to 44.5, and MP 44.8 to 46.2. The only areas outside the 500-year floodplain are at MP 0.0 to 1.0 and MP 6.8 to 7.2.

Segment F crosses approximately 0.3 miles (3.8 acres) of the Curry Creek 100-year floodplain at MP 0.3 to 0.5. The remaining 1.1 miles are outside the 500-year floodplain.

Segment G crosses approximately 0.4 miles (6.1 acres) of the 100-year floodplain, including two Curry Creek tributaries and one minor drainage at MP 2.0, MP 2.8, and MP 4.4, respectively. The remaining 4.6 miles are outside the 500-year floodplain.

Segment H (2.2 miles) is entirely outside the 500-year floodplain.

4.6.2 ENVIRONMENTAL CONSEQUENCES

The Proposed Action and alternatives would impact floodplains during and following construction of new access roads, structures, and temporary work sites within existing and new ROWs. Activities that result in additional fill within the floodplain or block water movement through the floodplain could reduce its capacity to dissipate the energy and volume of peak flows.

4.6.2.1 STANDARDS OF SIGNIFICANCE

The effects of the Proposed Action and alternatives would be considered significant if floodplains were substantially altered. The capacity of the watercourse to convey peak seasonal flows would be reduced, thereby increasing the stage and extent of a flood. Such a situation could cause an increase in risks to life, property, and downstream resources.

4.6.2.2 ENVIRONMENTAL PROTECTION MEASURES

EPMs for floodplains from Table 3-4 include the following:

- Hazardous materials would not be drained onto the ground, into streams, or into drainage areas. All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, would be removed to a disposal facility authorized to accept such materials.
- Irrigation system features, which are eligible for the NRHP, would be avoided during the siting of new transmission line structures and access roads, and most other irrigation system features would be avoided to the extent practicable in the siting of new structures and access roads.
- In construction areas (for example, material storage yards, structure sites, and spur roads from existing access roads) where ground disturbance is substantial or where recontouring is required, surface restoration would occur.
- Access roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be

installed where needed. All construction activities would be conducted to minimize disturbance to vegetation and drainage channels.

- Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm water runoff or can encroach, in any way, upon the watercourse.
- Nonbiodegradable debris would not be deposited in the ROW. Slash and other biodegradable debris would be left in place or disposed.
- All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excavated soil excess to these needs would be removed from the site and disposed of appropriately.
- To the extent possible, new structures and access roads would be sited out of floodplains. Due to the abundance of floodplains and surface water resources in the study area, complete avoidance may not be possible, and Western will consult with the USACE.
- Culverts would be installed where needed to avoid surface water impacts during construction of transmission line structures. All construction activities would be conducted in a manner to avoid impacts to water flow.

4.6.2.3 IMPACTS FROM PROPOSED ACTION— NEW TRANSMISSION O'BANION SUBSTATION TO ELVERTA SUBSTATION; REALIGNMENTS; RECONDUCTORING ELVERTA SUBSTATION TO TRACY SUBSTATION

Forty-seven miles of the Proposed Action occur within the 100-year floodplain. Within these 47 miles, approximately 163 new transmission line structures (99 for new construction, 64 for reconductoring) would be constructed along the new and existing ROW. These activities would disturb approximately 38 acres of the 100-year floodplain temporarily and 16 acres long term.

Another 29 miles of the Proposed Action occur within the 500-year floodplain. Within these 29 miles, 20 new structures would be constructed and 61 structures would be replaced during reconductoring. This would cause 19 acres of temporary disturbance and 8 acres of long-term disturbance to the 500-year floodplain.

Most impacts would be temporary and all would be less than significant when the EPMs are implemented (Table 3-4). The only long-term impacts would result from installing concrete footers and contouring for positive drainage at new transmission line structures. The ex-

pense of available floodplain within and surrounding the area would completely absorb any change resulting from such modifications. These negligible changes to the 100- and 500-year floodplain would not individually or cumulatively alter the capacity of the floodplain to convey and dissipate the volume and energy of peak flows. Therefore, the stage and extent of a flood would not be increased.

4.6.2.4 IMPACTS FROM ALTERNATIVE 1—RECONDUCTORING O'BANION SUBSTATION TO TRACY SUBSTATION

Forty-seven miles of Alternative 1 occur within the 100-year floodplain. Within these 46 miles, approximately 89 new transmission line structures would be constructed during reconductoring along the existing ROW. These activities would disturb approximately 20 acres of the 100-year floodplain temporarily and nine acres long term.

An additional 28 miles of the Alternative 1 alignment occur within the 500-year floodplain. Within these 28 miles, approximately 66 structures would be replaced during reconductoring. Resulting impacts to the 500-year floodplain would total approximately 15 acres of temporary disturbance and seven acres of long-term disturbance.

Floodplain impacts would be similar to those discussed for the Proposed Action. These negligible changes to the 100- and 500-year floodplain would not individually or cumulatively alter the capacity of the floodplain to convey and dissipate the volume and energy of peak flows. Therefore, the stage and extent of a flood would not be increased.

4.6.2.5 IMPACTS FROM ALTERNATIVE 2—NEW TRANSMISSION O'BANION SUBSTATION TO ELVERTA SUBSTATION AND REALIGNMENTS

Eighteen miles of Alternative 2 lie within the 100-year floodplain. Within these 18 miles, approximately 99 new transmission line structures would be constructed along the new and existing ROW. These activities would disturb approximately 23 acres of the 100-year floodplain temporarily and 10 acres long term.

An additional 3.4 miles of Alternative 2 alignment occur within the 500-year floodplain. Within these 3.4 miles, 20 new structures would be constructed. Resulting impacts to the 500-year floodplain would total approximately 4.5 acres of temporary disturbance and two acres of long-term disturbance.

Floodplain impacts would be similar to those discussed for the Proposed Action. These negligible changes to the 100- and 500-year floodplain would not individually or cumulatively alter the capacity of the floodplain to

convey and dissipate the volume and energy of peak flows. Therefore, the stage and extent of a flood would not be increased.

4.6.2.6 IMPACTS FROM ALTERNATIVE 3—NEW TRANSMISSION ELK GROVE SUBSTATION TO TRACY SUBSTATION

Twenty miles of Alternative 3 alignment occur within the 100-year floodplain. Within these 20 miles, approximately 96 new transmission line structures would be constructed along the new and existing ROW. These activities would disturb approximately 22 acres of the 100-year floodplain temporarily and 10 acres long term.

An additional 25 miles of the Alternative 3 alignment occur within the 500-year floodplain. Within these 25 miles, approximately 225 new structures would be constructed along the new ROW. Resulting impacts to the 500-year floodplain would total approximately 52 acres of temporary disturbance and 24 acres of long-term disturbance.

Floodplain impacts would be similar to those discussed for the Proposed Action. These negligible changes to the 100- and 500-year floodplain would not individually or cumulatively alter the capacity of the floodplain to convey and dissipate the volume and energy of peak flows. Therefore, the stage and extent of a flood would not be increased.

4.6.2.7 IMPACTS FROM THE NO ACTION ALTERNATIVE

Without the Proposed Action or action alternatives, no changes to existing facilities or alignment would occur and no new impacts to the active floodplain would be expected. Normal operation and maintenance, repairs, and emergency management of the system would continue as in the past. There are recognized temporary and insignificant impacts from maintaining access and transmission service (for example, vegetation management within the ROW). These impacts would continue as before and be avoided, minimized, or mitigated to the extent possible using Western's established EPMs (Table 3-4).

4.7 GEOLOGY

4.7.1 AFFECTED ENVIRONMENT

This section describes the existing geologic and hydrogeologic conditions and impacts from the implementation of the Proposed Action and alternatives. Geology includes discussions on grading, erosion, mining, and seismicity.

4.7.1.1 RESOURCE STUDY AREA

The focus of the study for geologic constraints and hazards is the transmission line ROW and nearby geolog-

ic faults including the Willows, Midland, Stockton, and Midway faults that could potentially affect the transmission lines.

4.7.1.2 ISSUES OF ENVIRONMENTAL CONCERN

Issues of environmental concern for geological resources include erosion, subsidence, landslides, and seismic and related hazards (liquefaction). They are discussed in the following section.

4.7.1.3 CHARACTERIZATION

Regional Setting

The study area lies within the Central Valley of California, a broad depositional basin between the Sierra Nevada Mountains on the east and the Coast Mountain Range on the west. The Central Valley is about 400 miles long by 50 miles wide and covers approximately 20,000 square miles. It contains the Sacramento Valley and the San Joaquin Valley. The surface elevation of the Central Valley lowland rises from slightly below sea level to about 400 feet above sea level at its north and south ends. The valley is unusual for a lowland area because it is a relatively undeformed basin surrounded by highly deformed rocks units. The Central Valley trough has been filled with as much as six vertical miles of sedimentary deposits in the San Joaquin Valley and ten vertical miles of deposits in the Sacramento Valley; these sediments range in age from Jurassic to Holocene. The Sacramento River drains the northern part of the Sacramento Valley, and the San Joaquin River drains the southern part of the San Joaquin Valley.

The geology in the Sacramento Valley relates to three different subbasins within the Sacramento Groundwater Basin: 1) the North American Subbasin; 2) the South American Subbasin; and 3) parts of the Cosumnes Subbasin.

The North American Subbasin lies in the eastern central portion of the Sacramento Groundwater Basin. The Bear River is its northern boundary, the Feather River is its western boundary, and the Sacramento River is its southern boundary. The eastern boundary is a north-south line extending from the Bear River south to Folsom Lake. The eastern boundary represents the approximate edge of the alluvial basin, where little or no groundwater flows into or out of the groundwater basin from the rock of the Sierra Nevada. The eastern portion of the study area is characterized by low, rolling dissected uplands. The western portion is nearly a flat flood basin for the Bear, Feather, Sacramento, and American rivers, and several small east side tributaries. The general direction of drainage is west to southwest at an average grade of about 5 percent (California Department of Water Resources [DWR] 2002, draft Bulletin 118).